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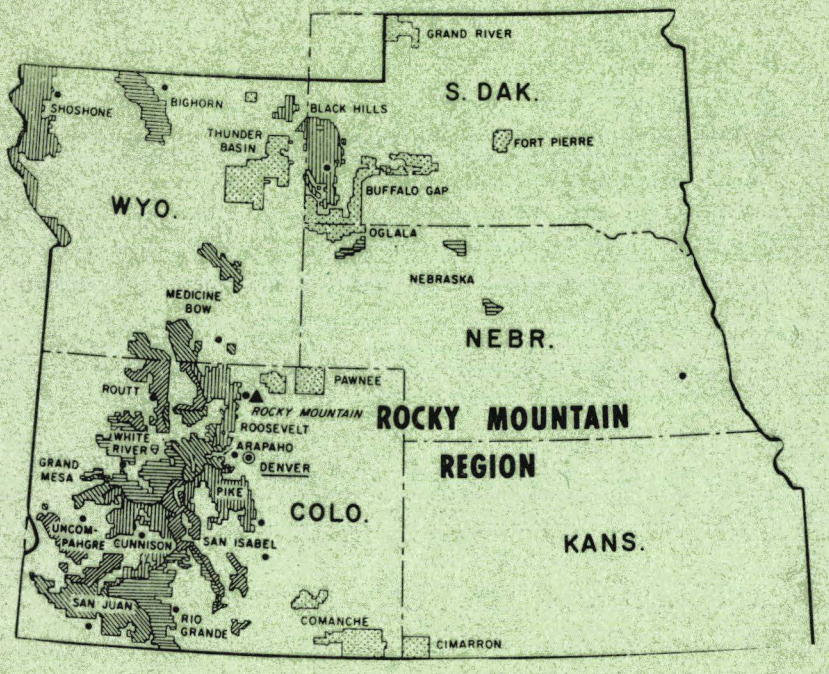
BIOLOGICAL EVALUATION

ZIMMERMAN PINE MOTH
Brown, Garfield, Holt, and Valley Counties, Nebraska



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BIOLOGICAL EVALUATION

ZIMMERMAN PINE MOTH
Brown, Garfield, Holt, and Valley Counties, Nebraska

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BIOLOGICAL EVALUATION

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INTRODUCTION

During the week of September 23rd, a biological evaluation of Zimmerman pine moth was conducted by Bob Averill, Entomologist, and Tom Landis, Pathologist. Assisting in the evaluation was Larry Barber of the Nebraska State and Extension Forestry. This pest was reported to be doing a considerable amount of damage on hard pines in the Nebraska National Forest in the 1920's (Baumhofer).

TECHNICAL INFORMATION

Causal Agent: Dioryctria zimmermani (Grote), Lepideoptera: Olethreutidae, zimmerman pine moth.

Host Trees Attacked: Ponderosa pine (Pinus ponderosa, Laws), Austrian pine (Pinus nigra, Arnold), Scotch pine (Pinus sylvestris, L.)

Type of Damage: Damage ranges from branch to top mortality in pines varying in height from 10 to 30 feet. The larvae feed under the bark in the cambial region. As the tree becomes weakened, strong winds and heavy snow cause branches and tree tops to be broken with ease. Some tree mortality may occur. The loss of tree height within a shelterbelt decreases its effectiveness as a windbreak.

Biological Data: Six infested plantings were surveyed for incidence of present or past successful insect attack damage. The range of incidence varied from 20% to 100% with the mean infestation being 74%. Plantings ranged in size from about 1/10 ac. to 4 ac. It appears that a population of Zimmerman will operate within a planting

from two to four years before damage becomes severe. Our observations indicate the insect is on an upward trend and is occupying a wider area in the Nebraska pine planting region. Extent of predation and parasitism is unknown at this time.

Environmental Factors: We are uncertain which environmental factors are important to Zimmerman moth at this time. However, many of the heavily infested stands were planted at a close spacing which, at this point in time, is causing extreme competition between stems for water and nutrients.

Extent of Outbreak: Infestations occur in shelterbelts in the following counties: Brown, Garfield, Holt, and Valley. Known distribution of Zimmerman in Nebraska for 1974 is depicted in Appendix 1. Future surveys will no doubt indicate a much broader distribution of this insect.

DISCUSSION

The Zimmerman pine moth appears to do more damage in plantations than in natural stands. Close spacing of new plantings, with no attempt to maintain tree vigor within the stand over time, often leads to pest problems. Such is the case in several of the plantings surveyed. The moth is creating a problem in that when tree tops become broken, gaps created in the windbreak may lower its effectiveness. There are several questions which must be answered before an effective management program can be instituted for this insect. What is the time interval between initial infestation and the onset of severe damage? How much damage can be tolerated in a planting before management objectives are lost? What natural mortality factors may be exploitable in managing Zimmerman? What are the site requirements for minimal threat; and is host tree resistance a possible factor? Until the above questions are answered, there are several course of action which should be considered.

RECOMMENDATIONS

1. That additional surveys be conducted in 1975 to further define the range of this insect's presence in Nebraska. In conjunction with these surveys, data should be taken which will indicate the impact of this "pest" on management objectives.

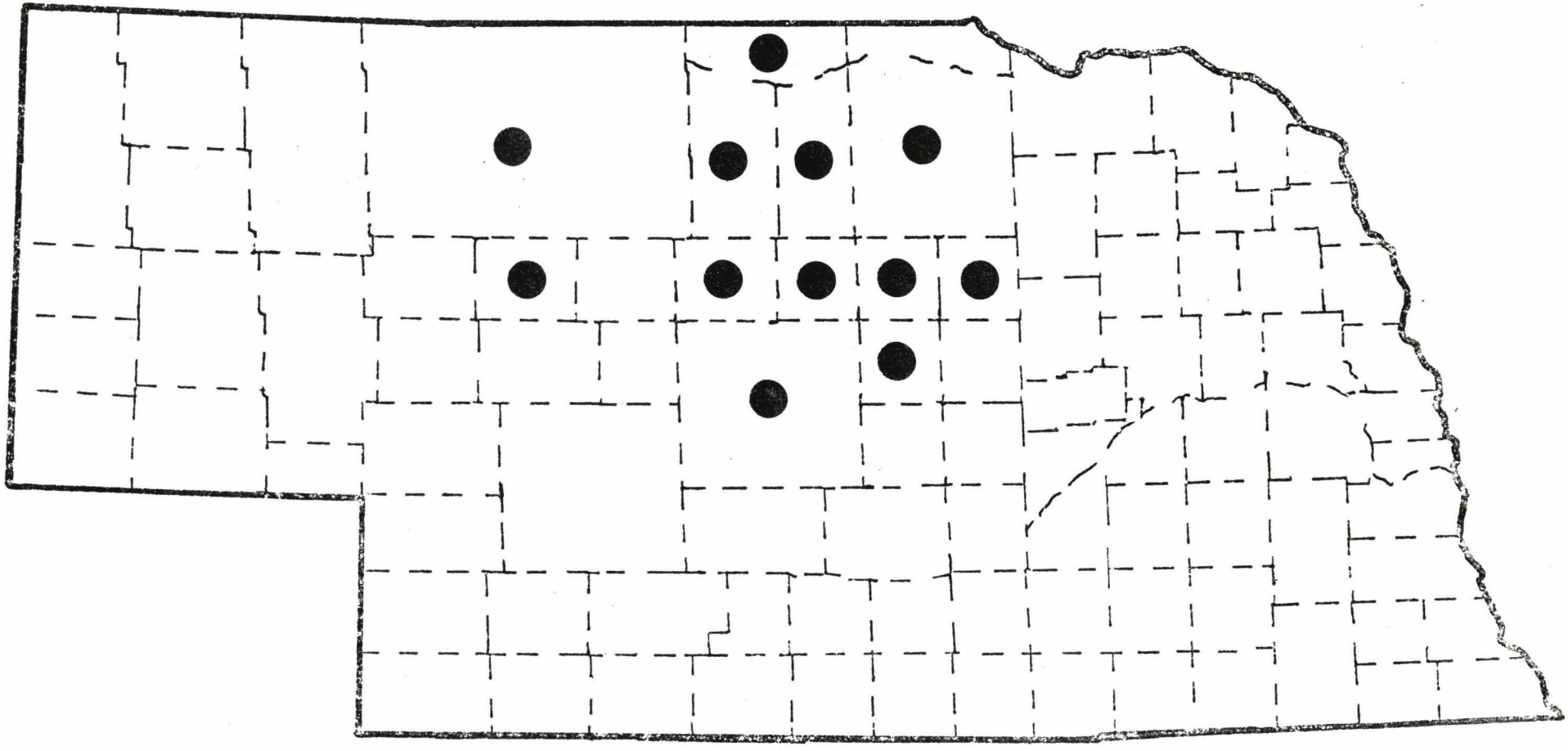
2. As a possible control measure, the thinning of infested stands to various stocking levels should be considered. Forest Pest Control can assist in the formulation and execution of such tests, if the State Forester so desires.

3. Pilot control spray tests are another alternative to consider as a control measure. Forest Pest Control can assist in the formulation and execution of such tests, if the State Forester desires. It should be pointed out that chemical control of this insect is difficult to accomplish since the bark on each stem must be drenched for any measure of success and current stocking in some stands would preclude this method until stand density is lowered.

REFERENCE

Baumhofer, L. G. 1930. Outline for revision of Forest Protection - Insect Section of Nebraska National Forest Silvical Report, Memorandum on file, Forest Pest Management, State and Private Forestry, Regional Office, Lakewood, Colorado

APPENDIX 1



Distribution of Dioryctria zimmermani(Grote), Nebraska 1974.